

CLAIM AMENDMENTS:

Claim 1 (currently amended): A combined semiconductor apparatus comprising;
a substrate;
a first thin semiconductor film comprised of a first material, and being disposed on and bonded to a surface of the substrate, the first thin semiconductor film including at least one semiconductor device;
a second thin semiconductor film comprised of a second material that is different than the first material, and being disposed on and bonded to the same surface side of the substrate as the first thin semiconductor film, the second thin semiconductor film including an integrated circuit and a first terminal; and
a first individual interconnecting line formed as a thin film extending from an upper side of the first thin semiconductor film over said surface of the substrate to an upper side of the second thin semiconductor film, electrically connecting the semiconductor device in the first thin semiconductor film to the first terminal in the second thin semiconductor film.

Claim 2 (previously presented): The combined semiconductor apparatus of claim 1, further comprising a layer of conductive material disposed between the first thin semiconductor film and the substrate, the layer of conductive material being formed on the substrate and the first thin semiconductor film being bonded

to only the layer of conductive material, whereby the first thin semiconductor film is bonded on the substrate.

Claim 3 (original): The combined semiconductor apparatus of claim 2, wherein the layer of conductive material is a metal layer or a polysilicon layer.

Claim 4 (original): The combined semiconductor apparatus of claim 1, wherein the substrate has glass, resin, a ceramic, metal, or a semiconductor as its principal material.

Claim 5 (original): The combined semiconductor apparatus of claim 1, further comprising a circuit pattern formed on the substrate, the circuit pattern comprising at least one of an interconnecting line, a resistor, and a capacitor.

Claim 6 (original): The combined semiconductor apparatus of claim 5, further comprising a second individual interconnecting line formed as a thin film, wherein:

 said second thin semiconductor film has a second terminal;
 the circuit pattern formed on the substrate has a third terminal; and
 the second individual interconnecting line extends from the second thin semiconductor film to the circuit pattern on the substrate, electrically interconnecting the second terminal with the third terminal.

Claim 7 (original): The combined semiconductor apparatus of claim 6, wherein the second individual interconnecting line is formed by photolithography.

Claim 8 (original): The combined semiconductor apparatus of claim 6, wherein the second individual interconnecting line comprises at least one of an Au layer, a Ti/Pt/Au multi-layer, an Au/Zn multi-layer, an AuGeNi/Au multi-layer, a Pd layer, a Pd/Au multi-layer, an Al layer, an Al/Ni multi-layer, a polysilicon layer, an ITO layer, and a ZnO layer.

Claim 9 (original): The combined semiconductor apparatus of claim 1, wherein the first thin semiconductor film has amorphous silicon, monocrystalline silicon, polysilicon, a compound semiconductor, or an organic semiconductor as its principal material.

Claim 10 (original): The combined semiconductor apparatus of claim 1, wherein the first thin semiconductor film is an epitaxially grown compound semiconductor film.

Claim 11 (original): The combined semiconductor apparatus of claim 10, wherein the first thin semiconductor film comprises, at least, one of $Al_xGa_{1-x}As$ ($0 \leq x < 1$), $(Al_xGa_{1-x})_yIn_{1-y}P$ ($0 \leq x < 1$ and $0 \leq y < 1$), GaN, AlGaN, and InGaN.

Claim 12 (original): The combined semiconductor apparatus of claim 1, wherein the semiconductor device in said first thin semiconductor film is one of a light-emitting device, a photodetector, a Hall element, and a piezoelectric device, and the integrated circuit in the second thin semiconductor film includes a driver circuit for driving the semiconductor device.

Claim 13 (original): The combined semiconductor apparatus of claim 1, wherein the first thin semiconductor film includes a plurality of semiconductor devices disposed at regular intervals, said semiconductor device being one of the plurality of semiconductor devices.

Claim 14 (original): The combined semiconductor apparatus of claim 1, wherein the first thin semiconductor film includes only one said semiconductor device.

Claim 15 (original): The combined semiconductor apparatus of claim 1, wherein a plurality of first thin semiconductor films are bonded to said surface of the substrate, said first thin semiconductor film being one of the plurality of first thin semiconductor films.

Claim 16 (original): The combined semiconductor apparatus of claim 1, wherein the second thin semiconductor film has recrystallized silicon,

monocrystalline silicon, polycrystalline silicon, a compound semiconductor, an organic semiconductor, or a polymer as its principal material.

Claim 17 (original): The combined semiconductor apparatus of claim 1, wherein a plurality of first thin semiconductor films are bonded to said surface of the substrate, said first thin semiconductor film being one of the plurality of first thin semiconductor films, the plurality of first thin semiconductor films being disposed in a row array, the second thin semiconductor film having a length substantially equal to a length of the linear array.

Claim 18 (original): The combined semiconductor apparatus of claim 1, wherein the first individual interconnecting line is formed by photolithography.

Claim 19 (original): The combined semiconductor apparatus of claim 1, wherein the first individual interconnecting line comprises at least one of an Au layer, a Ti/Pt/Au multi-layer, an Au/Zn multi-layer, an AuGeNi/Au multi-layer, a Pd layer, a Pd/Au multi-layer, an Al layer, an Al/Ni multi-layer, a polysilicon layer, an ITO layer, and a ZnO layer.

Claim 20 (previously presented): The combined semiconductor apparatus of claim 1, wherein the first and second thin semiconductor films are less than or equal to ten micrometers thick and more than or equal to 0.5 micrometers thick.

Claim 21 (original): The combined semiconductor apparatus of claim 1, wherein the first individual interconnecting line is less than two hundred micrometers long.

Claim 22 (original): The combined semiconductor apparatus of claim 1, wherein:

the thin semiconductor film includes a plurality of semiconductor devices disposed in a first array, said semiconductor device being one of the plurality of semiconductor devices;

the integrated circuit in the second thin semiconductor film includes a plurality of driving circuits disposed in a second array for driving the plurality of semiconductor devices;

the first array and the second array have substantially equal array pitches;

the driving circuits and the semiconductor devices are disposed in facing pairs; and

the combined semiconductor apparatus includes a plurality of first individual interconnecting lines electrically interconnecting the facing pairs of semiconductor devices and driving circuits, said first individual interconnecting line being one of the plurality of first individual interconnecting lines.

Claim 23 (original): An optical print head including the combined semiconductor apparatus of claim 1.

Claim 24 (original): The optical print head of claim 23, wherein the semiconductor device in the first thin semiconductor film in the combined semiconductor apparatus is a light-emitting element, the combined semiconductor apparatus including a plurality of such light-emitting elements, the optical print head further including:

- a base for supporting the combined semiconductor apparatus;
- a rod lens array for focusing the light emitted by the light-emitting elements in the combined semiconductor apparatus;
- a holder for holding the rod lens array; and
- at least one clamp for holding the base and the holder together.

Claim 25 (original): An image-forming apparatus comprising at least one optical print head including the combined semiconductor apparatus of claim 1.

Claim 26 (original): The image-forming apparatus of claim 25, further comprising:

- a photosensitive drum selectively illuminated by the optical printing head to form a latent electrostatic image.

Claim 27 (original): The image-forming apparatus of claim 26, further comprising:

- a developing unit for supplying toner to develop the latent electrostatic

image on the photosensitive drum; and

 a transfer roller for transferring the developed image from the photosensitive drum to printing media.

Claim 28 (previously presented): A combined semiconductor apparatus comprising:

 a substrate;

 a first thin semiconductor film comprised of a first material, and being disposed on and bonded to a surface of the substrate, the first thin semiconductor film including at least one semiconductor device;

 a second thin semiconductor film comprised of a second material that is different than the first material, and being disposed on and bonded to the same surface side of the substrate as the first thin semiconductor film, the second thin semiconductor film including an integrated circuit and a first terminal; and

 a first individual interconnecting line formed as a thin film extending from an upside of the first thin semiconductor film over said surface of the substrate to an upside of the second thin semiconductor film, electrically connecting the semiconductor device in the first thin semiconductor film to the first terminal in the second thin semiconductor film,

wherein the first and second thin semiconductor films are less than or equal to ten micrometers thick.

Claim 29 (currently amended): The combined semiconductor apparatus of claim 28, further comprising a second individual interconnecting line formed as a thin film, wherein:

 said second thin semiconductor film has a second terminal;
 the a circuit pattern formed on the substrate has a third terminal;
 the second individual interconnecting line extends from the second thin semiconductor film to the circuit pattern on the substrate, electrically interconnecting the second terminal with the third terminal; and
 the second individual interconnecting line is formed by photolithography.

Claim 30 (previously presented): The combined semiconductor apparatus of claim 28, wherein the first individual interconnecting line is formed by photolithography.

Claim 31 (previously presented): The combined semiconductor apparatus of claim 28, wherein the first and second thin semiconductor films are less than or equal to 10 micrometers thick and more than or equal to 0.5 micrometers thick..

Claim 32 (New): The combined semiconductor apparatus of claim 28, further comprising a layer of conductive material disposed between the first thin semiconductor film and the substrate, the layer of conductive material being formed on the substrate and the first thin semiconductor film being bonded to the

only layer of conductive material, whereby the first thin semiconductor film is bonded on the substrate.

Claim 33 (New): The combined semiconductor apparatus of claim 29, wherein the layer of conductive material is a metal layer or a polysilicon layer.

Claim 34 (New): The combined semiconductor apparatus of claim 28, wherein the substrate has glass, resin, a ceramic, metal, or a semiconductor as its principal material.

Claim 35 (New): The combined semiconductor apparatus of claim 28, further comprising a circuit pattern formed on the substrate, the circuit pattern comprising at least one of an interconnecting line, a resistor, and a capacitor.

Claim 36 (New): The combined semiconductor apparatus of claim 35, further comprising a second individual interconnecting line formed as a thin film, wherein:

 said second thin semiconductor film has a second terminal;
 the circuit pattern formed on the substrate has a third terminal; and
 the second individual interconnecting line extends from the second thin semiconductor film to the circuit pattern on the substrate, electrically interconnecting the second terminal with the third terminal.

Claim 37 (New): The combined semiconductor apparatus of claim 36, wherein the second individual interconnecting line is formed by photolithography.

Claim 38 (New): The combined semiconductor apparatus of claim 36, wherein the second individual interconnecting line comprises at least one of an Au layer, a Ti/Pt/Au multi-layer, an Au/Zn multi-layer, an AuGeNi/Au multi-layer, a Pd layer, a Pd/Au multi-layer, an Al layer, an Al/Ni multi-layer, a polysilicon layer, an ITO layer, and a ZnO layer.

Claim 39 (New): The combined semiconductor apparatus of claim 28, wherein the first thin semiconductor film has amorphous silicon, monocrystalline silicon, polysilicon, a compound semiconductor, or an organic semiconductor as its principal material

Claim 40 (New): The combined semiconductor apparatus of claim 28, wherein the first thin semiconductor film is an epitaxially grown compound semiconductor film.

Claim 41 (New): The combined semiconductor apparatus of claim 40. wherein the first thin 5emiconductor film comprises, at least, one of $Al_xGa_{1-x}As$ ($0 \leq x < 1$), $(Al_xGa_{1-x})_yIn_{1-y}P$ ($0 \leq x < 1$ and $0 \leq y < 1$), GaN, AlGaN, and InGaN.

Claim 42 (New): The combined semiconductor apparatus of claim 28, wherein the semiconductor device in said first thin semiconductor film is one of a light-emitting device, a photodetector, a Hall element, and a piezoelectric device, and the integrated circuit in the second thin semiconductor film includes a driver circuit for driving the semiconductor device.

Claim 43 (New): The combined semiconductor apparatus of claim 28, wherein the first thin semiconductor film includes a plurality of semiconductor devices disposed at regular intervals, said semiconductor device being one of the plurality of semiconductor devices.

Claim 44 (New): The combined semiconductor apparatus of claim 28, wherein the first thin semiconductor film includes only one said semiconductor device.

Claim 45 (New): The combined semiconductor apparatus of claim 28, wherein a plurality of first thin semiconductor films are bonded to said surface of the substrate, said first thin semiconductor film being one of the plurality of first thin semiconductor films.

Claim 46 (New): The combined semiconductor apparatus of claim 28, wherein the second thin semiconductor film has recrystallized silicon,

monocrystalline silicon, polycrystalline silicon, a compound semiconductor, an organic semiconductor, or a polymer as its principal material.

Claim 47 (New): The combined semiconductor apparatus of claim 28, wherein a plurality of first thin semiconductor films are bonded to said surface of the substrate, said first thin semiconductor film being one of the plurality of first thin semiconductor films, the plurality of first thin semiconductor films being disposed in a row array, the second thin semiconductor film having a length substantially equal to a length of the linear array.

Claim 48 (New): The combined semiconductor apparatus of claim 28, wherein the first individual interconnecting line is formed by photolithography.

Claim 49 (New): The combined semiconductor apparatus of claim 28, wherein the first individual interconnecting line comprises at least one of an Au layer, a Ti/Pt/Au multi-layer, an Au/Zn multi-layer, an AuGeNi/Au multi-layer, a Pd layer, a Pd/Au multi-layer, an Al layer, an Al/Ni multi-layer, a polysilicon layer, an TTO layer, and a ZnO layer.

Claim 50 (New): The combined semiconductor apparatus of claim 28, wherein the first and second thin semiconductor films are less than or equal to ten micrometers thick and more than or equal to 0.5 micrometers thick.

Claim 51 (New): The combined semiconductor apparatus of claim 28, wherein the first individual interconnecting line is less than two hundred micrometers long.

Claim 52 (New): The combined semiconductor apparatus of claim 26, wherein:

the thin semiconductor film includes a plurality of semiconductor devices disposed in a first array, said semiconductor device being one of the plurality of semiconductor devices;

the integrated circuit in the second thin semiconductor film includes a plurality of driving circuits disposed in a second array for driving the plurality of semiconductor devices;

the first array and the second array have substantially equal array pitches;

the driving circuits and the semiconductor devices are disposed in facing pairs; and

the combined semiconductor apparatus includes a plurality of first individual interconnecting lines electrically interconnecting the facing pairs of semiconductor devices and driving circuits, said first individual interconnecting line being one of the plurality of first individual interconnecting lines.

Claim 53 (New): An optical print head including the combined semiconductor apparatus of claim 28.

Claim 54 (New): The optical print head of claim 53, wherein the semiconductor device in the first thin semiconductor film in the combined semiconductor apparatus is a light-emitting element, the combined semiconductor apparatus including a plurality of such light-emitting elements, the optical print head further including:

- a base for supporting the combined semiconductor apparatus;
- a rod lens array for focusing the light emitted by the light-emitting elements in the combined semiconductor apparatus;
- a holder for holding the rod lens array; and
- at least one clamp for holding the base and the holder together.

Claim 55 (New): An image-forming apparatus comprising at least one optical print head including the combined semiconductor apparatus of claim 28.

Claim 56 (New): The image-forming apparatus of claim 55, further comprising:

- a photosensitive drum selectively illuminated by the optical printing head to form a latent electrostatic image.

Claim 57 (New): The image-forming apparatus of claim 56, further comprising:

- a developing unit for supplying toner to develop the latent electrostatic

image on the photosensitive drum; and

 a transfer roller for transferring the developed image from the
 photosensitive drum to printing media.

Claim 58 (New): A combined semiconductor apparatus comprising;

 a substrate;

 a first thin semiconductor film comprised of a first material, and being
 disposed on and bonded to a surface of the substrate, the first thin semiconductor
 film including at least one semiconductor device;

 a second thin semiconductor film comprised of a second material that is
 different than the first material, and being disposed on and bonded to the same
 surface side of the substrate as the first thin semiconductor film, the second thin
 semiconductor film including an integrated circuit and a first terminal;

 a first individual interconnecting line formed as a thin film extending from
 the first thin semiconductor film over said surface of the substrate to the second
 thin semiconductor film, electrically connecting the semiconductor device in the
 first thin semiconductor film to the first terminal in the second thin semiconductor
 film;

 a circuit pattern formed on the substrate, the circuit pattern comprising at
 least one of an interconnecting line, a resistor, and a capacitor; and

 a second individual interconnecting line formed as a thin film, wherein:
 said second thin semiconductor film has a second terminal;

the circuit pattern formed on the substrate has a third terminal; and
the second individual interconnecting line extends from the second
thin semiconductor film to the circuit pattern on the substrate, electrically
interconnecting the second terminal with the third terminal.